

Impact of Harvesting and Thinning on Poorly Drained Systems

Issue: Forested wetlands are valuable resources to society due to their ability to sustain or improve water quality. Forested wetlands perform important biochemical functions on the forest landscape. Drained plantation pine account for as much as 1 million hectares in the coastal plain region of the United States. Forest management operations have been reported to affect annual and seasonal outflow characteristics from drained forest watersheds. Non-point source inputs of nutrients are identified as a major concerns and problems to estuary and coastal waters. There is a gap in our current understanding of the effect of forest management operations on forest outflow quantity and quality of drained coastal managed forest. Understanding is needed concerning how the observed transient impacts of forest management operations on hydrology and water quality at the forest stand level impact downstream ecosystems.



Study Description: The study site is part of a large watershed project (~8100 ha), located in Washington County near Plymouth, North Carolina. The site is poorly drained and nearly flat, with shallow water table in its natural condition. Watersheds are isolated into small forest blocks by a network of roads and series of drainage ditches. Parallel lateral ditches of 1.4 – 1.8-m depth with 100-m spacing, drain each watershed. The first research site (Research site 1) is a 44-ha old-growth natural hardwood stand. The second site (Research site 2) is a 12-year-old 56-ha Loblolly Pine plantation.



Status: Water monitoring stations, observation wells, and instrumentation were installed during early Spring 99. Soil property baseline has been collected and one year of hydrology record and ground water quality data has been completed. Treatments (harvesting & thinning) were applied during the Spring 01. Post-treatment soil physical property data was collected immediately following treatment application. Monitoring will continue through the subsequent flow season (December 01 – May 02). Preliminary data analysis and reporting will be accomplished by the end of FY 02.

Benefits:

- *The primary objective of this work is to evaluate effects of harvesting and thinning operations on forest outflow and soil physical properties.*
- *Valuable data to be used in construction and validation of harvesting and thinning scenarios for water prediction models*
- *Valuable information on impacts of forest operations on drained forest water quality.*
- *Modeling with DRAINMOD to evaluate applicability as a planning tool in forest management on lands with shallow water tables.*

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